

## Thin Film Nanocomposites Based on YBCO with Defects Comprised of Self-assembled Inclusions

O. V. Boytsova<sup>1</sup>, A. R. Kaul<sup>1</sup>, S. V. Samoilenkov<sup>2</sup>, I. E. Voloshin<sup>3</sup>

<sup>1</sup>Department of Material Science, Chemistry Department,  
Moscow State University, 119992, Moscow, Russia

<sup>2</sup>Institute of High Temperature RAS, Izhorskaja 13/19, 125412, Moscow, Russia

<sup>3</sup>All-Russian Electrical Engineering Inst – Moscow, Russia

E-mail: [boytsova@gmail.com](mailto:boytsova@gmail.com)

**Abstract** - The critical current of YBCO superconducting coatings in external magnetic field can be enhanced by incorporating high density of extended nanometer-sized defects to act as pinning centers for magnetic vortices. One particular variant involves the deposition superconducting film with columnar defects comprised of self-assembled BaZrO<sub>3</sub>, BaSnO<sub>3</sub> or BaHfO<sub>3</sub> nanoinclusions. Here we report the results of our study of YBCO films with different inclusions prepared by MOCVD. For the first time, we succeeded in growth of YBCO films with oriented nanoinclusions of BaCeO<sub>3</sub> phase and demonstrate that it does not reduce  $T_c$  of YBCO, in contrast to BaZrO<sub>3</sub> or BaSnO<sub>3</sub>. The best composite thin films revealed the  $T_c$  value of about 88K and critical current density at 77K above 1MA/cm<sup>2</sup> in self-field and around 0.3 MA/cm<sup>2</sup> in 1 T (B//c).

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